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WEAKON

ENTERTAINMENT

Search for the elusive Weakon particle!
(age 8 and up)

by Eric Freeman

Cassette version (1) ATARI 410 or 1010
Program Recorder
(APX-10260) 16K RAM

Diskette version (1) ATARI 810 or 1050 Disk Drive
(APX-20260) 16K RAM

Edition A

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Program and manual contents ©1983 Eric Freeman

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Introduction

OVERVIEW

If you've ever thought about the tiny particles of the subatomic world, you must have wondered about those protons and photons, so small that no one has ever seen them. Here's a game that takes you to that subatomic world — in search of the elusive Weakons. Your objective is to capture as many Weakons as you can and deliver them to the generator at the center of the screen.

But watch out! Your craft shrinks to subatomic size, so you have to use your joystick to dodge the particles zooming from right to left across the screen. You crash if a meson or gamma photon or ionizing radiation cloud hits you. If you don't blast the mesons away, they come back to get you. You seek out the Weakons that appear every 20 seconds, and guide them carefully to the generator. When you dock in the center barrel, the energy dial registers your total.

Capturing several Weakons causes the particle accelerator at the bottom of the screen to speed up, making your task even more hazardous. But your score mounts and eventually you're awarded more lives for your skill. There are ten difficulty levels that you can choose as you grow more expert at the game. Challenge a friend to try the two-player version, too.

REQUIRED ACCESSORIES

One ATARI Joystick per player

Cassette version

16K RAM

ATARI 410 or 1010 Program Recorder

Diskette version

16K RAM

ATARI 310 or 1050 Disk Drive

CONTACTING THE AUTHOR

Users wishing to contact the author may write to him at:

P.O. Box 10005

Balmoral

Auckland

New Zealand

Getting started

LOADING WEAKON INTO COMPUTER MEMORY

1. Remove any program cartridge from the cartridge slot of your computer.
2. Plug your joystick controllers into the first controller jack of your computer console. (To play the two-player version, plug two joysticks into the first two controller jacks.)
3. If you have the cassette version of WEAKON:
 - a. Have your computer turned OFF.
 - b. Turn on your TV set.
 - c. Insert the WEAKON cassette into the program recorder's cassette holder and press REWIND on the recorder until the tape rewinds completely. Then press PLAY to prepare the program recorder for loading the program.
 - d. Turn on the computer while holding down the START key.
 - e. When you hear a beep, release the START key and press the RETURN key. The program will load into computer memory and start automatically.

If you have the diskette version of WEAKON:

- a. Have your computer turned OFF.
- b. Turn on your disk drive.
- c. When the busy light goes out, open the disk drive door and insert the WEAKON diskette with the label in the lower right hand corner nearest to you. Close the door. (Use disk drive one if you have more than one drive).

d. Turn on your computer and your TV set. The program will load into computer memory and start automatically.

THE FIRST DISPLAY SCREEN

When the program has loaded into computer memory, the following screen displays:

WEAKON
1983
(C) ERIC FREEMAN

SECOND DISPLAY SCREEN

The following soon appears to replace the first display screen:

1 PLAYER GAME

PRESS SELECT
FOR 2 PLAYERS

PRESS OPTION TO
CHANGE LEVEL 01

PRESS START
TO BEGIN GAME

SELECTING GAME OPTIONS

Difficulty

The title screen shows difficulty level one. Press the OPTION key to raise the level as far as 10. You may hold the OPTION key down continuously to change levels.

During game play press the OPTION key to return to the first screen. Then press the OPTION key again to advance levels.

Number of players

You may play WEAKON with one or two players. The game is set at first for a one player game, but you can switch it back and forth by pressing the SELECT key.

Playing WEAKON

After you've made your choices, press the START key to begin the game. The shrinkage process begins as your craft appears in the middle of the screen. The accelerator is at the bottom and the proton/antiproton target is on the right. Almost immediately particles shed off the target and streak from right to left toward you. Destroy them by pressing the joystick button when they're in line with the center of your craft.

The gamma photons are shaped like horizontal bars with jagged edges. They're attracted to the electromagnetic field around you. They're hard to hit, and they destroy you if they hit you first. If you dodge them successfully, they just disappear off the left side of the screen.

The ionizing radiation isn't as difficult to destroy. It's a larger target with an indistinct shape. But it usually has some angular deviation, so you should maneuver quickly in front before you fire.

Less frequently a large meson darts about the screen. It's a large figure with some particles surrounding it. Destroy the mesons! They're attracted to your craft, but unlike the photons, they don't disappear off the left side of your screen. They might come back after you just when you think you're safe.

The Weakon appears about every 20 seconds. If you can catch it with the 'cup' at the top of your craft, the pulse generator appears in the middle of the screen. Maneuver towards the left side of the generator and place the Weakon in the center barrel. When you've docked accurately, the energy dial appears and you're disconnected from the Weakon. Each unit of energy is worth 10 points.

After a short delay the shrinkage begins again. and you're back in the energy vortex.

LEVEL ADVANCING

Catching two Weakons increases the accelerator energy. This means your playing level goes up and things happen faster. There are ten levels in all but if you survive the tenth (it's highly unlikely!) the speed of play remains at that level.

SCORE PANEL

In the one-player game the score panel at the top of the screen appears as follows:

YOUR SCORE 000000

In the two player game the score panel looks like this:

PLAYER ONE 000000 PLAYER TWO 000000

SCORING

You score points for destroying advancing particles and catching Weakons, as follows:

POINTS TABLE

GAMMA PHOTON	... 20 POINTS
IONIZING RADIATION	... 40 POINTS
MESONS	... 60 POINTS
WEAKONS	FROM 650 TO 1280 POINTS

MISSILE FIRING

You can fire the weapons on your craft continuously by holding down the joystick button. But the key to winning the game is dodging projectiles fired out of the target proton/antiproton.

LIVES REMAINING

The number of lives remaining is displayed by the figures at the bottom center of the play field. This tally doesn't include the craft you're using. For example, at the beginning of play when you have four craft, you see three figures on the display, besides your present player.

EXTRA MAN

An extra craft is allotted when you gain 10000 points. This bonus is displayed in the "lives remaining" position.

HIGH SCORE DISPLAY

The computer keeps the highest score earned since you loaded the program. This is displayed when all players have lost all their craft in any particular game. You may move either joystick in any direction to restart the game when the high score is displayed.

LEVEL DISPLAY

The current skill level is displayed in the bottom right corner of the playing screen. There are ten levels increasing in difficulty from 1 to 10.

Interrupting the game

PAUSING

Press the space bar on your keyboard to freeze the display and stop play temporarily. Press the space bar again to resume play.

RESTARTING A GAME

Press the START key at any time to restart your current game.

Hints

Use continual vertical motion to avoid the photons, which aim directly for you if you stay still.

The photons are difficult to hit, but tapping the joystick often works better for lining them up than more aggressive movement.

Get as many points as you can in the lower screens before catching any WEAKONS.

You must aim at the center of the ionizing radiation and the mesons to destroy them.

Stay towards the left side of the screen if possible. This allows more reaction time.

Author's footnote

This game was inspired by the search for the elusive Weakons, massive elementary particles thought to be the carriers of the weak nuclear force. The group of three particles more properly known as intermediate vector bosons are currently being sought in the products of high energy particle collisions, most notably in the end result of colliding a proton beam with a counter rotating anti proton beam. The three varieties proposed by the vague electroweak theory are the charged W^+ and W^- and the neutral Z^0 . The former two may have been observed recently at the European Organization for Nuclear Research (CERN) facilities in Geneva. After observing a billion high energy events, two separate groups working with different detection apparatus decided five candidates' collisions showed unambiguous evidence for the existence of the W particle.

The Z particle, thought to be ten times as rare as the W bosons, won't be seriously looked for until the 2000 billion electron volt particle accelerator at Fermilab is completed in 1985. The current energies achieved at CERN approach 540 billion electron volts (540 GeV).

By comparison the mass of the W Weakon has been tentatively determined as 79.5 GeV with the Z^0 weighing in at 90 GeV. The particle's large mass is a consequence of the manner in which the weak nuclear force acts over very small distances. The massless photon, carrier of the electromagnetic force, is thought to have an infinite range so conversely it was proposed in 1935 by Japanese physicist Hideki Yukawa that the carriers of the weak and strong nuclear forces must have mass. The moderately heavy pi meson was found to be the carrier of the strong force in 1947. This indicated that the shorter acting weak force must use a heavier carrier, but no machine existed at the time with sufficient energy to search for it.

In the late 1960s and 70s a theory unifying the electromagnetic and weak nuclear forces was developed independently by a number of physicists and the search for Weakons was on in earnest again. By finding this particle the electroweak theory will be one more link in the chain towards the grand unification of all nature's forces.

Reference and inspiration:

David B. Cline, Carlo Rubbia, and Simon van der Meer, "The Search for Intermediate Vector Bosons", Scientific American, March 1982

Haim Harari, "The Structure of Quarks and Leptons," Scientific American, April 1983.



ATARI Program Exchange

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Review Form

We're interested in your experiences with APX programs and documentation, both favorable and unfavorable. Many of our authors are eager to improve their programs if they know what you want. And, of course, we want to know about any bugs that slipped by us, so that the author can fix them. We also want to

know whether our instructions are meeting your needs. You are our best source for suggesting improvements! Please help us by taking a moment to fill in this review sheet. Fold the sheet in thirds and seal it so that the address on the bottom of the back becomes the envelope front. Thank you for helping us!

1. Name and APX number of program.
Weakon (260)

2. If you have problems using the program, please describe them here.

3. What do you especially like about this program?

4. What do you think the program's weaknesses are?

5. How can the catalog description be more accurate or comprehensive?

6. On a scale of 1 to 10, 1 being "poor" and 10 being "excellent", please rate the following aspects of this program:

- _____ Easy to use
- _____ User-oriented (e.g., menus, prompts, clear language)
- _____ Enjoyable
- _____ Self-instructive
- _____ Use (non-game programs)
- _____ Imaginative graphics and sound

7. Describe any technical errors you found in the user instructions (please give page numbers).

8. What did you especially like about the user instructions?

9. What revisions or additions would improve these instructions?

10. On a scale of 1 to 10, 1 representing "poor" and 10 representing "excellent", how would you rate the user instructions and why?

11. Other comments about the program or user instructions:

From

STAMP

APX

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[seal here]